164139

Monsanto

F. J. Helmer - W. G. Krummrich Plant

DATE: October 14, 1977

SUBJECT: DEFINITION OF WGK WASTE STREAMS

REFERENCE: Memo, same subject, Pierle to Heisler and Smull dated 8/30/77

TO: TSD SUPERINTENDENTS

F. J. Basile
R. L. Harness
P. E. Heisler
H. J. Horner
J. W. Molloy
W. L. Smull
Manufacturing Supts.
Manufacturing Gen. Supts.
M. A. Pierle - ElSA

Definition of WGK Waste Streams, 10-14-77

The Corporate Administrative Committee has promulgated worldwide environmental protection guidelines for Monsanto. The first guideline calls for the establishment of discharge standards for each process. Such standards are to be established by January 1, 1980, with compliance by January 1, 1983. Before discharge standards can be set, it is necessary to determine present levels of discharges.

W. L. Smull has asked me to work with our Environmental Control and Industrial Hygiene Group to develope a program for the orderly definition of waste streams from the WGK plant processes. In cooperation with Frank Basile and Bob Harness, a program has been developed and is presented here for your consideration and comment.

Goals of the Program:

1. Determine the composition and quantity of emissions to the air from all process vents.

   These emissions will be either gases, vapors, or particulates.

2. Determine the composition and quantity of all discharges to the sewer from each process.

   These discharges will be either liquid, slurry, or in some cases, solids.

3. Determine the composition and quantity of all "solid" wastes from each process.

   Solid wastes are those streams normally drummed or hauled away in trucks.

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TIMING

These goals are to be accomplished by July 31st, 1979. Sampling of vents and recording of data should begin immediately, with the Department Representatives (as explained below) taking the initiative. The Department Representatives will be the "Project Sponsors" for the waste stream determination activity in their areas.

RESPONSIBILITY

The TSD Superintendents have primary responsibility for the completion of of program in their zones. Frank Basile will provide stack sampling service for air emissions where "normal" department sampling will not suffice. Bob Harness will provide sampling service for sewer streams where "normal" department sampling procedures will not suffice. Solids sampling will usually be done by the department. Hap Horner will provide the necessary analytical backup. It may be necessary to supplement the existing sampling and analytical functions in order to meet the deadline.

AIR EMISSIONS - PLAN OF ATTACK

1. Select Department Representative

   The TSD Superintendent will select a waste stream representative for each department, two or more representatives may be needed. In some zones, one man can cover two or more departments. The representative will normally be a TSD engineer but could be a supervisor or foreman.

2. Name and List All Vents

   The representative will prepare a list (standard forms are attached) of all the vents in the department, naming them by department, vessel, and function, as in the following examples:

   221 Denitration Tower Vent
   233 MCB Stripper Jet Exhaust
   222 Autoclave R. D. Relief

   The complete phrase is thus the name of the vent as well as an unambigous description. This straight forward naming technique is used in place of a numerical code because it eliminates any possibility of confusion. There may be dozens of vents in the department. For the sake of completeness, all vents must be named and listed.

AIR EMISSIONS - PLAN OF ATTACK (Con't)

3. Divide the List into "Must Sample" and "Can Calculate"

After assembling the list, the representative will break it down into two sections, Section 1 should contain all vents which will require sampling and/or analysis. Examples are process vessel vents, dust collector discharges, and steam jet discharge lines where yield losses are suspected. Section 2 will contain the vents which do not require sampling or analysis. Emissions, if any, can be calculated or estimated. For example, storage tank vents need not be sampled because the contents are known. The quantity of discharge can be calculated knowing tank turnover rates, vapor pressure and average head space volume. There are also many rupture disc relief lines and pressure relief lines in the departments. These must be named and listed but no measurement is possible and no analysis is necessary. If it is known that a pressure relief line relieves on a more or less regular basis, this fact should be noted and the volume estimated.

4. Check for Existing Data

After the list of department vents is assembled, the representative will take it to the Environmental Control and Industrial Hygiene Group Representative (Frank Basile or his delegate) and together they will check the existing records to see if analyses or measurements already exist. The department representative must judge if existing data still fits the current situation.

5. Assignment of Priority and Responsibility

In cases where sampling and analysis is necessary, the department representative will list the order of priority of work for the guidance of the Environmental Control and Industrial Hygiene Group. Priority will normally be given to high volume streams or toxic discharges. The responsibility for sampling must also be determined at that time. If the sample cannot be obtained by "normal" department methods, the Environment Control and Industrial Hygiene Group will handle it.

AIR EMISSIONS - PLAN OF ATTACK (Cont'd)

6. Execution of Sampling, Analysis and Completion of the Forms

With the priority of Section 1 vents determined, the Environmental Control and Industrial Hygiene Group will schedule their sampling work, keeping the department representative informed as to their timing and other special needs. The department representative will keep department supervision informed of plans and progress. The Environmental Control and Industrial Hygiene representative will see to it that any sample which he takes is analyzed. He will send a copy of this analysis to the department representative who will record it on the forms. The department representative will fill out the form for the Section 2 vents, making calculations and/or estimates as required.

The responsibility for keeping the forms and recording all information is the responsibility of the department representative. He is the custodian of the forms.

7. Reporting on Progress

The department representative will write a one or two paragraph memo each month, describing progress and plans, with newly completed vent information attached. Addressee is the TSD Superintendent with copies to the Manufacturing Superintendent, Department Supervisor, Frank Basile, Hap Horner, and Warren Smull.

SEWER DISCHARGES - PLAN OF ATTACK

The procedure here is almost identical to the air emissions program except that Bob Harness is the Environmental Control and Industrial Hygiene contact. The department representative is again the key man. The important steps in the plan are:

1. Select Department Representative

In most cases, one Department Representative will handle the determination work on all the waste streams - air, sewer, and solid.

SEWER DISCHARGES - PLAN OF ATTACK (Cont'd)

2. Name and List all Sewer Discharge Streams

Again, all streams are listed. They will be named by department and vessel, as in the following examples:

221 #2 Settler Overflow
221 Chiller Steam Pig Condensate Discharge

The complete phase is thus the name as well as the description of the sewer discharge source.

3. Divide the List into "Must Sample" and "Can Calculate"

Essentially the same as in the air emission section.

4. Check for Existing Data

Department representative checks list of sewer discharges with Environmental Control and Industrial Hygiene (Bob Harness or delagate) and also within the department and TSD files. The department representative must pass judgement on the useability of existing data.

5. Assignment of Sampling Priority and Responsibility

Essentially the same as in air emissions section.

6. Execution of Sampling, Analysis, and Completion of the Forms

Essentially the same as in the air emissions section, except that Bob Harness is the Environmental Control and Industrial Hygiene contact. The department representative is responsible for listing all data and keeping the forms.

7. Reporting on Progress

Essentially the same as in the air emissions section, but addressee is the TSD Superintendent with copies to the Manufacturing Superintendent, Department Supervisor, Bob Harness, and Warren Smull.

SOLIDS WASTES - PLAN OF ATTACK

Again, the procedures is essentially the same as in the air and sewer sections. Frank Basile is the Environmental Control and Industrial Hygiene contact. Reporting will be the same as in air emissions program.

If you have comments or suggestions, please communicate them to me by October 25th, 1977.

Frank
F. J. Helmer

ed
att.

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Air Emissions - Vent List

Ref. No.	Vent Name / Dept, Vessel, Function	Emission Mode: Continu.	Emission Mode: Periodic	Emission Mode: S.U. or Malfunc. only	Composition of Emission	Quantity Emitted: Avg. #/day	Quantity Emitted: Range hi #/hr.	Quantity Emitted: Range low #/hr.	Average Emission Per lb. Product	Comments

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Solid Wastes

Ref. No.	Solid Waste Name / Dept. Description	Source	How Packaged?	Quantity #/mo.	Solids Generation, #/# prod.	Present Means of Disposal	Comments

Discharges to Sewer

Ref. No.	Discharge Stream Name / Dept, Vessel, Function	Discharge Mode: Contin.	Discharge Mode: Periodic	Discharge Mode: S.U. or Malfunc. only	Composition of Discharge	Quantity Discharged: Avg. # / day	Quantity Discharged: Range hi # / hr.	Quantity Discharged: Range Low # / hr.	Average Discharge per lb. Product	Comments

ONA/PNA WASTE STREAM COMPOSITE

Nerve & tissue Breakdown for all new streams.

STREAM	H_2O #/DAY	ONA #/DAY	PNA #/DAY	NCB #/DAY	PNP #/DAY	OTHER ORGANICS #/DAY	NH_3 #/DAY	NH_4Cl #/DAY	NaCl #/DAY	NaOH #/DAY
ONA M/L ok	47304	585	9	9	-	-	585	10008	-	-
ONA DEHYDRATOR ok	29993	135	-	22.5	-	-	-	-	-	-
ONA COLUMN ok	30015	72	-	13.5	-	49.5(1b)	-	-	-	-
[redacted] Column Stripper	[redacted] 148509	112	[redacted] 300	4	78	-	- 24	-	14616	500
[redacted] VENT	[redacted]	-	-	[redacted]	gone	-	-	-	-	-
[redacted] ONE BOTTOM TANK	[redacted] 152864	-	[redacted] 760	-	-	-	[redacted] 80	[redacted] 36	-	-
PNCB SLUDGE WATER ok	6360	-	2	38	-	-	-	-	-	-
WASH-UP WATER ok	132000	-	~~213~~ 852 (misc. losses)	-	-	-	-	-	-	-
MAIN	18000	-	-	-	-	-	-	-	-	-
TOTALS 365044	[redacted]	904	1323	87	78	49.5	609 89	10044	14616	500
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

153140

611335

AVERAGE ORGANICS = 0[redacted] 24 49.5 [redacted] ~~ORGANICS/DAY~~

gpm (AVG.) = ~~5C~~ [redacted] gpm (S.G.1.02) → large amount of [redacted] 72000 ~~GALLONS/DAY~~

(57-65 gpm by 1977 Sewer Flow) this is solids - not dissolved. Solubility at 45°C ≤ 0.1%

[redacted]

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ONA/PNA WASTE STREAM COMPOSITE

STREAM	H_2O #/DAY	ONA #/DAY	PNA #/DAY	NCB #/DAY	PNP #/DAY	OTHER ORGANICS #/DAY	NH_3 #/DAY	NH_4Cl #/DAY	NaCl #/DAY	NaOH #/DAY
ONA M/L	47304	585	9	9	-	-	585	10008	-	-
ONA DEHYDRATOR	29993	135	-	22.5	-	-	-	-	-	-
ONA COLUMN	30015	72	-	13.5	-	49.5(1b)	-	-	-	-
PNA M/L	96592	112	78	4	78	-	-	-	14616	520
PNA CRYSTALLIZER VENT	12760	-	-	40	-	-	-	-	-	-
ONE BOTTOM TANK	155724	-	160	-	-	-	80	36	-	-
NCB SLUDGE WATER	6360	-	2	38	-	-	-	-	-	-
ASH-UP WATER	132000	-	213 (misc. losses)	-	-	-	-	-	-	-
AIN	18000	-	-	-	-	-	-	-	-	-
OTALS	528,748	904	462	127	78	49.5	665	10044	14616	520
	95.06	.163	.083	.023	.014	.009	.12	1.8	2.63	.0934

AVERAGE ORGANICS = 0.292% 1621# ORGANICS/DAY

gpm (AVG.) = 45.5 gpm (S.G.1.02) 65,463 GALLONS/DAY

ONP WASTE STREAM

STREAM	H_2O #/DAY	ONP #/DAY	PNP #/DAY	Na_2SO_4 #/DAY	NaCl #/DAY	H_2SO_4 #/DAY
DECANT M/L	~~482067.5~~	~~688.5~~	~~68.85~~	~~90467~~	~~49519.4~~	~~1091.5~~
WASH-UP	48000	-	-	-	-	-
RAIN	6000	-	-	-	-	-
TOTALS	536067.5	688.5	68.85	90467	49519.4	1091.5
%	79.08	.102	.0102	13.345	7.305	.161

multiply by .666 - 2 reactor sys.

469934.6
~~677902~~.5

Average Organic Concentration = 0.11%

505
~~757~~.4# Organics/Day

gpm (AVG.) (S.G. = 1.1) = ~~51.5~~ 39.6 gpm

~~73983~~ 51086 Gallons/Day

7/19/77
MPD

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No lime waste streams

Stripping column bottoms
Stm 37

75# PNA
6# NH_3
37127 # H_2O
125 # NaOH
3654 # NaCl
40~~3~~987 # Total

check Brine table

~~56~~ = ~~4708~~
1.06 per Brine table (close enough)
8.825#/gal

Core Bottom Tank
Stm.

40# PNA/PNP
9# NH_4Cl
20 # NH_3
38216 # H_2O

38285 #

est ~~235~~ 60 Additional NH_3 loss (MISC.)
813/60 MISC PNA loss (unidentified)

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